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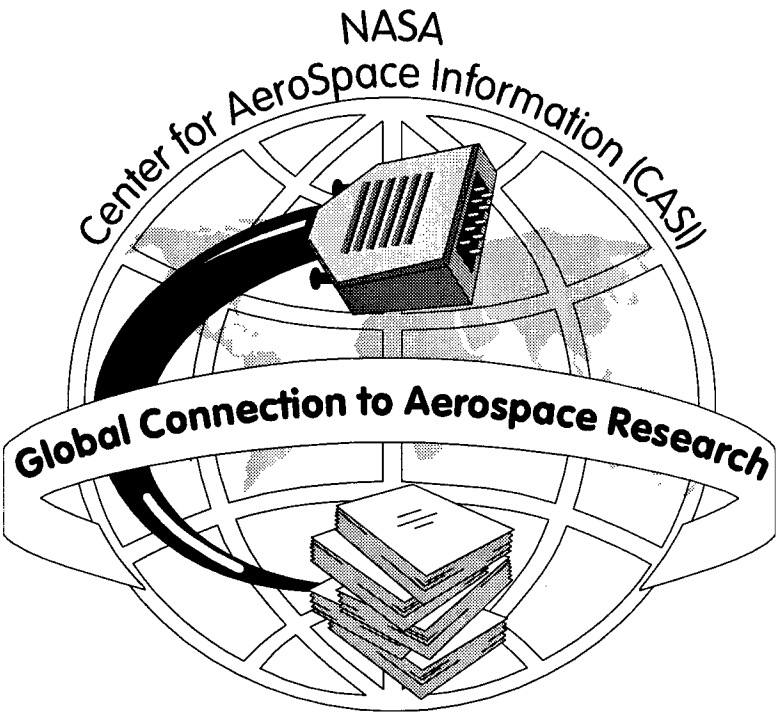

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NORTH ATLANTIC TREATY ORGANIZATION

RESEARCH AND TECHNOLOGY ORGANIZATION

BP 25, 7 RUE ANCELLE, F-92201 NEUILLY-SUR-SEINE CEDEX, FRANCE

RTO TECHNICAL REPORT 25

Databases for Assessment of Military Speech Technology Equipment

(les Bases de données pour l'évaluation des équipements de technologie vocale militaire)

This Technical Report has been prepared at the request of the RTO Information Systems Technology Panel (IST).

Published March 2000

Distribution and Availability on Back Cover

RTO-TR-25
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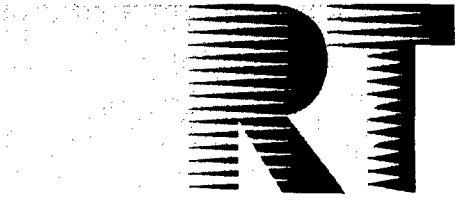
NORTH ATLANTIC TREATY ORGANIZATION



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Databases for Assessment of Military Speech Technology Equipment

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by

Mr. Allan SOUTH, DERA United Kingdom

This Technical Report has been prepared at the request of the RTO Information Systems Technology Panel (IST).

The Research and Technology Organization (RTO) of NATO

RTO is the single focus in NATO for Defence Research and Technology activities. Its mission is to conduct and promote cooperative research and information exchange. The objective is to support the development and effective use of national defence research and technology and to meet the military needs of the Alliance, to maintain a technological lead, and to provide advice to NATO and national decision makers. The RTO performs its mission with the support of an extensive network of national experts. It also ensures effective coordination with other NATO bodies involved in R&T activities.

RTO reports both to the Military Committee of NATO and to the Conference of National Armament Directors. It comprises a Research and Technology Board (RTB) as the highest level of national representation and the Research and Technology Agency (RTA), a dedicated staff with its headquarters in Neuilly, near Paris, France. In order to facilitate contacts with the military users and other NATO activities, a small part of the RTA staff is located in NATO Headquarters in Brussels. The Brussels staff also coordinates RTO's cooperation with nations in Middle and Eastern Europe, to which RTO attaches particular importance especially as working together in the field of research is one of the more promising areas of initial cooperation.

The total spectrum of R&T activities is covered by 7 Panels, dealing with:

- SAS Studies, Analysis and Simulation
- SCI Systems Concepts and Integration
- SET Sensors and Electronics Technology
- IST Information Systems Technology
- AVT Applied Vehicle Technology
- HFM Human Factors and Medicine
- MSG Modelling and Simulation

These Panels are made up of national representatives as well as generally recognised 'world class' scientists. The Panels also provide a communication link to military users and other NATO bodies. RTO's scientific and technological work is carried out by Technical Teams, created for specific activities and with a specific duration. Such Technical Teams can organise workshops, symposia, field trials, lecture series and training courses. An important function of these Technical Teams is to ensure the continuity of the expert networks.

RTO builds upon earlier cooperation in defence research and technology as set-up under the Advisory Group for Aerospace Research and Development (AGARD) and the Defence Research Group (DRG). AGARD and the DRG share common roots in that they were both established at the initiative of Dr Theodore von Kármán, a leading aerospace scientist, who early on recognised the importance of scientific support for the Allied Armed Forces. RTO is capitalising on these common roots in order to provide the Alliance and the NATO nations with a strong scientific and technological basis that will guarantee a solid base for the future.

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Databases for Assessment of Military Speech Technology Equipment

(RTO TR-25)

Executive Summary

(i) A NATO research group carries out collaborative studies on military applications of speech processing. A major requirement in this area of work is for large quantities of speech recordings made in military environments, which are often expensive and difficult to obtain. Research and development in this area will benefit from sharing such data as widely as possible among the NATO research community.

MAJOR RECOMMENDATIONS

(ii) The NATO research group on speech processing should continue to collate and disseminate information about available speech databases of relevance to research and development of military speech technology.

MILITARY IMPLICATIONS

(iii) The cost of collecting speech recordings under realistic military conditions is high. Considerable cost savings may be made if such data are shared as widely as possible amongst the NATO community. Robust performance under field conditions will also be improved by exposure to a wide variety of speech during development.

FURTHER WORK

(iv) The NATO research study group on speech and language technology (IST-TG001) will continue to maintain and update the database of speech recordings relevant to military applications of speech technology. Further ways of disseminating this information will be sought, including electronic means such as the Internet.

Les bases de données pour l'évaluation des équipements de technologie vocale militaire

(RTO TR-25)

Synthèse

(i) Un groupe de recherche OTAN effectue des études sur les applications militaires du traitement de la parole. Dans ce domaine il faut de grandes quantités d'enregistrements effectués en environnement militaire, enregistrements qui sont souvent coûteux et difficiles à obtenir. La recherche et le développement ne peuvent que bénéficier d'un partage aussi large que possible de telles ressources au sein des pays de l'OTAN.

RECOMMANDATIONS MAJEURES

(ii) Le groupe de recherche OTAN étudiant le traitement de la parole doit continuer à collecter et à disséminer l'information sur les bases de données de parole, disponibles et pertinentes, pour la recherche et le développement des technologies vocales militaires.

ENJEUS MILITAIRES

(iii) Le coût de la collecte d'enregistrements de parole dans des conditions militaires réalistes est élevé. Des économies considérables peuvent être réalisées si de telles données sont partagées aussi largement que possible au sein de la communauté OTAN. La robustesse des systèmes en conditions réelles sera aussi améliorée grâce à la confrontation à une grande variété de telles données pendant leur développement.

PERSPECTIVES

(iv) Le groupe de recherche OTAN étudiant le traitement de la parole continuera à tenir à jour la base de données d'enregistrement de parole pour l'évaluation des équipements de technologie vocale militaire. Des voies supplémentaires de diffusion de cette information seront recherchées, y compris les moyens électroniques tels qu'Internet.

Contents

Preface

Speech technology has the potential to be of great use in many areas of military operations. Large quantities of realistic speech recordings are a necessity for research in this area, and for the assessment of techniques and equipment. Collection of such speech recordings is usually expensive and time-consuming, so considerable savings may be made if such data are shared between users in NATO countries. This work was started by the former DRG Research Study Group (RSG10).

This report describes a database maintained by the Task Group on Speech and Language Technology of the RTO Information Systems Technology Panel. The report contains details of speech recordings relevant to military operations, which may be made available to NATO partners. The aim of this report is to increase awareness of this database, so that the benefits of sharing the recordings may be maximized.

Préface

Les technologies vocales ont le potentiel d'être très utiles dans de nombreux domaines des opérations militaires. De grandes quantités d'enregistrements réalistes sont nécessaires pour la recherche dans ce domaine et pour l'évaluation des techniques et des équipements. La collecte de tels enregistrements est généralement coûteuse et consommatrice de temps, et des économies substancielles pourraient être faites si de telles données étaient partagées entre les utilisateurs des pays de l'OTAN. Ce travail a été initié par l'ancien groupe de recherche et d'étude RSG10.

Ce rapport décrit une base de données tenue à jour par le groupe sur le traitement de la parole et du langage, groupe issu de la commission RTO sur les technologies des systèmes d'information (IST). Il fournit des détails sur les enregistrements de parole utiles pour les opérations militaires, qui sont disponibles pour les partenaires de l'OTAN. Le but de ce rapport est de mieux faire connaître cette base de données, de manière à bénéficier au mieux des possibilités de partager ces enregistrements.

Foreword

Efficient speech communication is recognized as a critical and instrumental capability in many military applications such as command and control, aircraft and vehicle operations, military communication, translation, intelligence, and training. The former NATO research study group on speech processing (AC243 (Panel 3) RSG.10) conducts since its establishment in 1978 experiments and surveys focused on military applications of language processing. Presently the work is performed by the IST Task Group 001. Guided by its mandate, the former RSG.10 initiated in the past the publication of overviews on potential applications of speech technology for military use and also organized several workshops and lecture series on military-relevant speech technology topics. In recent years, the speech R&D community has developed or enhanced many technologies which can now be integrated into a wide-range of military applications and systems. Development and assessment of speech technology for military applications requires representative speech material. In the past many data bases have been collected and distributed on various means such as CD-ROM. This report gives an overview of representative databases for military speech research.

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1. INTRODUCTION

The former Research Study Group on Speech Processing (AC243/Panel 3/RSG.10) was set up in 1978 in order to address speech processing issues of interest to military system designers. The Group has since conducted collaborative projects on isolated and connected word recognition (Bridle, 1983), recognition in a multi-lingual environment (Moore 1988), and recognition in additive noise (Steeneken and Varga 1993, Gagnon and Cupples 1995). Workshops have been organised on dialogue structures (Taylor, Néel, and Bouwhuis, eds. 1989), Applications of Speech Technology (Mangold, Hunt, and Néel, 1993)., and Speech under Stress (Moore and Trancoso, 1995). Two major reports have been produced on the military applications of speech technology (Weinstein 1991, Steeneken (ed.) 1996.). Presently the work is continued by the RTO-IST Task group (AC 232/IST/TG001).

A by-product of some of these projects has been the creation of databases of speech recordings suitable for the assessment of the performance of speech technology equipment under military conditions. In addition, speech databases have been created as part of the work of various laboratories working with speech technology for military applications. Many of these databases can be made available to other researchers within the NATO countries, so RSG.10 has maintained a list of them for several years. The purpose of this report is to increase awareness of this list in order to facilitate exchange of information and resources between NATO countries.

2. MILITARY BENEFIT

Speech and language technology has many potential applications in military operations, including command and control, intelligence, man-machine interface, machine translation, and others (Steeneken (ed) 1996). A general problem in research and development in speech technology is the availability of suitable databases of speech recordings for assessment of the equipment. These databases need to be as realistic as possible, to recreate the many effects that stresses in the military environment may have on speech production. However, the collection of realistic recordings of military speech is often expensive (for example, in fast-jet cockpits) and usually requires a considerable effort to process the recordings into computer-readable format afterwards. For this reason, such resources are valuable and considerable cost savings may be made by sharing them between researchers where possible.

The field performance of speech technology equipment should also benefit in the long run. Robust performance under changing conditions is a necessity for successful military application, and exposure to a wider variety of speech data during development will encourage this.

3. THE DATABASE LISTING

3.1 Structure

The database listing is maintained as a Microsoft Access™ database consisting of two linked tables. The main table contains details of the speech recordings, and a second table contains details of the institutions which produced them and a person to contact. Separate tables are used to avoid duplication of data; only a limited number of organisations produce speech databases for military applications, so that a single entry in the contacts table may be referred to by several entries in the database table. Full details of the database structures are given in Annex A. In many cases, there is no information in some of the less important fields.

3.2 Inclusion Criteria

The criteria for inclusion in the listing are:

- Military relevance
- Availability to other researchers within NATO.

Military relevance may result from the vocabulary, noise background, microphone type, type of stress on the speaker, multi-linguality, or any other characteristic which may arise in the context of military usage of speech technology. Availability may be as a result of open publication or by mutual agreement between the database producer and an institution wishing to use it.

Recordings of noises encountered in military situations are also included because of their direct relevance to the performance of speech technology equipment.

Information about other speech and language databases (not intended specifically for military applications) is available from the Linguistic Data Consortium and the European Language Resources Association. Contact details for these organisations are given in Annex C.

3.3 Report Formats

Three formats of reports are available, differing in the amount of detail supplied. The first gives only a list of contents of the database, with the title, language and year of creation of each entry. The second gives a summary of the main fields of each entry, while the third gives full details of all entries. A copy of the current full report is included at Annex B.

3.4 Updating

The listing is maintained at the Defence Evaluation and Research Agency (DERA), Farnborough, UK, by the author of this report, who is necessarily dependent on the database producers for details of the recordings and for awareness of their existence. The intention is to produce an update twice each year, if new information has been received.

3.5 Dissemination of the Listing

A copy of the database and the reports produced from it are available on the RSG.10 ftp server which may be accessed via anonymous login at:

site: ftp.tm.tno.nl
username: rsginfo (no password required).

These files will be updated about every six months, providing that new information has been added to the database. Copies may also be obtained from the author at the address given in Annex B.

Other information relating to Speech Under Stress may be obtained from a site on the World Wide Web maintained by the Robust Speech Processing Laboratory at Duke University, North Carolina, USA. The address is

http:/www.ee.duke.edu/Research/Speech/stress.html.

4. CONCLUSION

Speech technology has considerable potential benefits for military operations, but assessment of systems under realistic conditions requires large corpora of speech recordings which are expensive to collect. Significant savings may be made if speech corpora can be shared with other potential users within NATO. This report has described a database of information relating to speech recordings of military relevance, with the aim of making potential users aware of what is available. The database is maintained at DERA Farnborough, UK, on behalf of the NATO Research Study Group on Speech Processing (AC243/Panel 3/RSG.10). At the time of writing, the details of 40 speech and noise corpora are included.

5. REFERENCES

Bridle, J. S. (1983). "Connected word recognition for use in military systems" NATO DRG document AC/243(Panel 3) D218.

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Steeneken, H. J. M. ed. (1996) "Potentials of speech and language technology systems for military use: an application and technology oriented survey."

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Weinstein, C. J. (1991). "Opportunities for advanced speech processing in military computer-based systems." NATO DRG document AC/243(Panel 3) TR/9

ANNEX A. Database Structures

SPEECHDB table:

Field name	Type	Size	Properties
SerialNo	Number	Int.	Required, Index field
Name	Text	50	Req
Brief Description	Text	100	Req
Brief Purpose	Text	100	Req
Date of creation	Number	Int.	Req, Index field, (year)
Material	Text	50	Req
Language	Text	20	Req
Quantity	Number	Int	(recording time in hours)
No. of Speakers	Number	Int	
Gender of speakers	Text	6	(MALE, FEMALE, or BOTH)
Native Language	Text	20	(defaults to Language)
Recording Medium	Text	30	Req
Sampling Rate	Text	10	
Microphone	Text	30	
Contact Number	Number	Int	Req, Index, Link-CONTACTS
Author 1	Text	50	(of report describing database)
Author 2	Text	50	
Author 3	Text	50	
Report Title	Text	100	
Year of Pub.	Number	Int	(Year of publication)
Publisher	Text	50	(Organisation, Book, Journal, etc.)
Report Number	Text	50	
Availability	Text	30	(Open, restricted, etc.)
Users	Text	30	(Institutions known to be using it)
Applications	Text	30	Req (Application intended by producer)
Full Description	Text	255	(More detailed description)
Annotation	Text	30	(Format of labelling)
Aux. Info.	Text	50	
Signal type	Text	30	(eg waveform, LPC params)
Date info entered	Date	(17)	Long date

CONTACTS table:

Field name	Type	Size	Properties
Name	Text	30	Req (Contact person for database)
Department	Text	30	
Institution	Text	50	Req
Abbr Inst	Text	15	(Usual abbreviation for institution)
Street	Text	50	
Town	Text	40	Req
State	Text	40	
Postcode	Text	15	
Country	Text	40	Req
Telephone	Text	20	
FAX	Text	20	
Email	Text	50	
Serial Number	Number	int	Req, Index field

ANNEX B. Database Listing

TG001 SPEECH DATABASE LISTING

Full Report

Serial No: **1** Database Name: **Diagnostic Rhyme Test**
Description: **20 Lists of 96 words each**
Purpose: **Measurement of DRT scores of transmission channels**
Material: **Rhyme Words Selected on 6 Phonetic Features** Language: **Dutch**
Quantity: 5 Hours No of Spkrs: **4** Gender: **MALE** Year: **1982**
Microphone: Signal: **Waveform** Sampling Rate: **N/A**
Medium: **Analogue tape 7.5 ips** Annotation:
Availability: **Unlimited** Applications: **Comms**
Aux Info:
Contact: **Dr. H J M Steeneken** Institute: **TNO/IZF**
Telephone: **+31 3463 56269** Fax: **+31 3463 53977**
E-mail: **steeneken@tm.tno.nl** Date Entered: 08 March 1994

Serial No: **2** Database Name: **Helicopter Word List**
Description: **Vocabulary of 60 words, 3 flight conditions**
Purpose: **Evaluation of automatic speech recognition**
Material: **Cockpit Vocabulary** Language: **English**
Quantity: 2 Hours No of Spkrs: **4** Gender: **MALE** Year: **1986**
Microphone: **Boom** Signal: **Waveform** Sampling Rate:
Medium: **Analogue tape** Annotation:
Availability: **Unlimited** Applications: **Aircraft**
Aux Info:
Contact: **Dr. H J M Steeneken** Institute: **TNO/IZF**
Telephone: **+31 3463 56269** Fax: **+31 3463 53977**
E-mail: **steeneken@tm.tno.nl** Date Entered: 08 March 1994

Serial No: **3** Database Name: **RSG.10 Noise Database**
Description: **29 samples of military noises**
Purpose: **To standardise some noises for speech research**
Material: **Noises in tanks, aircraft, ships, etc.** Language: **Noise**
Quantity: 2 Hours No of Spkrs: **0** Gender: **-** Year: **1990**
Microphone: **Various** Signal: **Waveform** Sampling Rate: **16 kHz**
Medium: **one CD-ROM** Annotation: **N/A**
Availability: **Unlimited** Applications: **Military**
Aux Info:
Contact: **Dr. H J M Steeneken** Institute: **TNO/IZF**
Telephone: **+31 3463 56269** Fax: **+31 3463 53977**
E-mail: **steeneken@tm.tno.nl** Date Entered: 30 October 1996

Serial No: **4** Database Name: **NATO-RSG.10 Spoken Digit Database**
Description: **Isolated connected digits in several languages**
Purpose: **To compare performance of connected word recognisers on native and non-native speakers**
Material: **Digits** Language: **DuFrGeUKUS**
Quantity: 20 Hours No of Spkrs: **19** Gender: **BOTH** Year: **1982**
Microphone: Signal: **Waveform** Sampling Rate: **N/A**
Medium: **Analogue tape** Annotation:
Availability: Applications: **Assessment**
Aux Info:
Contact: **J S Garofolo** Institute: **NIST**
Telephone: Fax:
E-mail: Date Entered: 24 March 1997

Serial No: **5** Database Name: **RSRE 1983 Speech Database**
Description: **Isolated and connected words with various speaking styles**
Purpose: **Recognition Algorithm development and testing**
Material: **Digits, Letters, DRT Words, others** Language: **UK English**
Quantity: **100** Hours No of Spkrs: **15** Gender: **BOTH** Year: **1983**
Microphone: **SM-10** Signal: **Waveform** Sampling Rate:
Medium: **SONY PCM** Annotation:
Availability: **Unlimited** Applications: **Assessment**
Aux Info:
Contact: **J McQuillan** Institute: **DERA/SRU**
Telephone: **+44 1684 894361** Fax: **+44 1684 894540**
E-mail: **jmq@signal.dra.hmg.gb** Date Entered: 24 March 1997

Serial No: **6** Database Name: **40-Speaker Digit Database**
Description: **400 isolated digits per speaker**
Purpose: **To study speaker consistency**
Material: **Digits** Language: **UK English**
Quantity: **10** Hours No of Spkrs: **40** Gender: **BOTH** Year: **1986**
Microphone: Signal: **Waveform** Sampling Rate:
Medium: **SONY PCM** Annotation:
Availability: **Unlimited** Applications: **Research**
Aux Info:
Contact: **J McQuillan** Institute: **DERA/SRU**
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E-mail: **jmq@signal.dra.hmg.gb** Date Entered: 24 March 1997

Serial No: **7** Database Name: **DUR-Words**
Description: **word pairs**
Purpose: **To study durational clues**
Material: **11 minimally distinct word pairs** Language: **UK English**
Quantity: **1** Hours No of Spkrs: **?** Gender: **MALE** Year: **1982**
Microphone: Signal: **Channel vocoder data** Sampling Rate:
Medium: **Computer files** Annotation:
Availability: **Unlimited** Applications: **Research**
Aux Info:
Contact: **J McQuillan** Institute: **DERA/SRU**
Telephone: **+44 1684 894361** Fax: **+44 1684 894540**
E-mail: **jmq@signal.dra.hmg.gb** Date Entered: 08 March 1994

Serial No: **8** Database Name: **POLS Noise Tape**
Description: **Speech plus speech spectrum noise at various SNRs**
Purpose: **Assessment**
Material: **Isolated and Connected Digits** Language: **English**
Quantity: **1** Hours No of Spkrs: **1** Gender: **MALE** Year: **1983**
Microphone: Signal: **Waveform** Sampling Rate:
Medium: **SONY PCM** Annotation:
Availability: **Unlimited** Applications: **Assessment**
Aux Info:
Contact: **Dr. H J M Steeneken** Institute: **TNO/IZF**
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Serial No: **9** Database Name: **POLS Babble Tape**
Description: **Speech + STITEL noiseat various SNRs**
Purpose: **Assessment**
Material: **Digits** Language: **English**
Quantity: **1** Hours No of Spkrs: **1** Gender: **MALE** Year: **1987**
Microphone: Signal: **Waveform** Sampling Rate:
Medium: **SONY PCM** Annotation:
Availability: **Unlimited** Applications: **Research**
Aux Info:
Contact: **Dr. H J M Steeneken** Institute: **TNO/IZF**
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E-mail: **steeneken@tm.tno.nl** Date Entered: 08 March 1994

Serial No: **10** Database Name: **BAC 111 Recordings**
Description: **Recordings made in the cockpit of a BAC 111 airliner**
Purpose: **Research**
Material: **Digits and Words from RSRE 1983 Database** Language: **UK English**
Quantity: **4** Hours No of Spkrs: **12** Gender: **?** Year: **1984**
Microphone: Signal: **Waveform** Sampling Rate:
Medium: **SONY PCM** Annotation:
Availability: **Unlimited** Applications: **Aircraft**
Aux Info:
Contact: **J McQuillan** Institute: **DERA/SRU**
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E-mail: **jmq@signal.dra.hmg.gb** Date Entered: 08 March 1994

Serial No: **11** Database Name: **Speech Recordings in Buccaneer Cockpit Noise**
Description: **Recorded in noise simulator with 116 dB of Buccaneer spectrum noise,**
Purpose: **Evaluation of ASR1000 speech recogniser**
Material: **Digits, DRT Words and common Telephone Words** Language: **UK English**
Quantity: **20** Hours No of Spkrs: **5** Gender: **MALE** Year: **1986**
Microphone: **Oxygen mask** Signal: **Waveform** Sampling Rate:
Medium: **SONY PCM** Annotation:
Availability: **Unlimited** Applications: **Fast-jet aircraft**
Aux Info:
Contact: **A J South** Institute: **DERA/Farnboro'**
Telephone: **+44 1252 392496** Fax: **+44 1252 393091**
E-mail: **ajsouth@dra.hmg.gb** Date Entered: 24 March 1997

Serial No: **12** Database Name: **Noise-in-Ears Database**
Description: **Recorded with 90dB noise-in-ears, and noise mixed with speech at defined SNRs**
Purpose: **Evaluation of ASR1000 speech recogniser**
Material: **Digits** Language: **UK English**
Quantity: **36** Hours No of Spkrs: **6** Gender: **MALE** Year: **1987**
Microphone: **Oxygen mask** Signal: **Waveform** Sampling Rate:
Medium: **SONY PCM** Annotation:
Availability: **Unlimited** Applications: **Fast-jet aircraft**
Aux Info:
Contact: **A J South** Institute: **DERA/Farnboro'**
Telephone: **+44 1252 392496** Fax: **+44 1252 393091**
E-mail: **ajsouth@dra.hmg.gb** Date Entered: 24 March 1997

Serial No: **13** Database Name: **Speaker-Independent Connected Speech Database**
Description: **Various isolated and connected utterances from 200 word vocab**
Purpose: **Evaluation of automatic speech recognition**
Material: **Digit Strings, Alphabet, & Phrases** Language: **US English**
Quantity: **21** Hours No of Spkrs: **46** Gender: **BOTH** Year: **1985**
Microphone: Signal: **Waveform** Sampling Rate:
Medium: **Analogue cassette tape** Annotation:
Availability: **Unlimited** Applications: **Assessment**
Aux Info:
Contact: **E J Cupples** Institute: **Rome Labs**
Telephone: **+1 315 330 4024** Fax: **+1 315 330 2728**
E-mail: **cupples@rl.af.mil** Date Entered: 24 March 1997

Serial No: **14** Database Name: **RADC Language Identification Database**
Description: **Read text in 7 languages in several quiet environments**
Purpose: **Development, test and evaluation of language identification algorithms and techniques**
Material: **Text** Language: **Several**
Quantity: **50** Hours No of Spkrs: **131** Gender: **?** Year: **1979**
Microphone: Signal: **Waveform** Sampling Rate:
Medium: **Analogue tape 7.5 ips** Annotation:
Availability: **On special request** Applications: **Military**
Aux Info:
Contact: **E J Cupples** Institute: **Rome Labs**
Telephone: **+1 315 330 4024** Fax: **+1 315 330 2728**
E-mail: **cupples@rl.af.mil** Date Entered: 24 March 1997

Serial No: **15** Database Name: **ARPA Voice Authentication Database**
Description: **Conversational speech over telephone channels**
Purpose: **Development, test and evaluation of speaker identification algorithms and techniques**
Material: **Free Speech, Read Sentences, CVs & Keywords** Language: **US English**
Quantity: **43** Hours No of Spkrs: **17** Gender: **BOTH** Year: **1978**
Microphone: Signal: **Waveform** Sampling Rate: **8000**
Medium: **Analogue tape** Annotation:
Availability: Applications: **Speaker identification**
Aux Info:
Contact: **S Smith** Institute: **Rome Labs**
Telephone: Fax:
E-mail: Date Entered: 09 March 1994

Serial No: **16** Database Name: **Air Force Academy Database**
Description: **Phonetic alphabet, digits, and seven sentences (2 standard, 5 randomly selected)**
Purpose: **Evaluation of speaker-independent recognition**
Material: **Digits, Phonetice Alphabet, Sentences** Language: **US English**
Quantity: **50** Hours No of Spkrs: **635** Gender: **BOTH** Year: **1987**
Microphone: **Capacitor & Noise Cancelling** Signal: **Waveform, Lx** Sampling Rate:
Medium: **BETA Format PCM** Annotation:
Availability: **Unlimited** Applications: **Recognition**
Aux Info: **demographic info on subjects**
Contact: **E J Cupples** Institute: **Rome Labs**
Telephone: **+1 315 330 4024** Fax: **+1 315 330 2728**
E-mail: **cupples@rl.af.mil** Date Entered: 24 March 1997

Serial No: **17** Database Name: **CVC Word lists**
Description: **CVCs using common phonemes in Dutch**
Purpose: **Intelligibility measurements of communications systems and room acoustics**
Material: **CVC words in carrier phrases** Language: **Dutch**
Quantity: **20** Hours No of Spkrs: **8** Gender: **BOTH** Year: **1990**
Microphone: **1/2" Condenser** Signal: **Waveform** Sampling Rate: **48 kHz**
Medium: **DAT** Annotation:
Availability: **Unlimited** Applications: **Testing communication systems**
Aux Info:
Contact: **Dr. H J M Steeneken** Institute: **TNO/IZF**
Telephone: **+31 3463 56269** Fax: **+31 3463 53977**
E-mail: **steeneken@tm.tno.nl** Date Entered: 24 March 1997

Serial No: **18** Database Name: **DCIEM Military Vehicle Noises**
Description: **Many noises recorded in military vehicles of all kinds**
Purpose: **Noise Survey**
Material: **Noises** Language: **Noise**
Quantity: **2** Hours No of Spkrs: **0** Gender: **-** Year: **1975**
Microphone: **Free-Field, + Electret** Signal: **Waveform** Sampling Rate: **N/A**
Medium: **Analogue tape 7.5 ips** Annotation:
Availability: Applications: **Military**
Aux Info:
Contact: **B Crabtree** Institute: **DCIEM**
Telephone: Fax:
E-mail:
Date Entered: 09 March 1994

Serial No: **19** Database Name: **EUROM-0**
Description: **Digits and Speech in 5 languages, 4 speakers each**
Purpose: **Multi-lingual speech input/output assessment**
Material: **Isolated digits, digit triples, continuous passage** Language: **DaDuFrItUK**
Quantity: **5** Hours No of Spkrs: **20** Gender: **BOTH** Year: **1988**
Microphone: **B&K 1/2" condenser, type 4134** Signal: **Speech waveform,** Sampling Rate: **16 kHz**
Medium: **CD-ROM** Annotation: **available separately**
Availability: **from ESPRIT-SAM partners** Applications: **Assessment**
Aux Info: **German available separately**
Contact: **Prof S Rosen** Institute: **UCL**
Telephone: Fax:
E-mail: Date Entered: 01 November 1996

Serial No: **20** Database Name: **NOISE-ROM -0**
Description: **Extended version of RSG.10 Noise database (entry No 4)**
Purpose: **Standard set of noises for speech research**
Material: **Various noises, mainly military vehicles** Language: **Noise**
Quantity: **2** Hours No of Spkrs: **0** Gender: **-** Year: **1990**
Microphone: **Various** Signal: **Waveform** Sampling Rate: **20 kHz**
Medium: **CD-ROM** Annotation:
Availability: **Media charge** Applications: **Military**
Aux Info:
Contact: **Dr. H J M Steeneken** Institute: **TNO/IZF**
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Serial No: **21** Database Name: **DARPA TIMIT Acoustic-Phonetic Speech Database**
Description: **TIMIT training data**
Purpose: **Recogniser assessment**
Material: **Sentences** Language: **US English**
Quantity: **2** Hours No of Spkrs: **?** Gender: **?** Year: **1988**
Microphone: **high quality** Signal: **Waveform** Sampling Rate: **16 kHz**
Medium: **CD-ROM** Annotation: **Orthographic and phonetic**
Availability: **Unlimited** Applications: **Various**
Aux Info: **Documentation on CD-ROM**
Contact: **Linguistic Data Corporation** Institute: **LDC**
Telephone: **+1 215 898-0464** Fax: **+1 215 573-2175**
E-mail: **ldc@ldc.upenn.edu** Date Entered: 30 March 1994

Serial No: **22** Database Name: **DARPA Resource Management Database**
Description: **Naval resource management task, continuous speech**
Purpose: **Assessment of large vocabulary continuous speech recognisers**
Material: **Dialect calibration, training and test sentences** Language: **US English**
Quantity: **15** Hours No of Spkrs: **160** Gender: **BOTH** Year: **1990**
Microphone: **Sennheiser HMD-414** Signal: **Waveform** Sampling Rate: **16 kHz**
Medium: **CD-ROM** Annotation:
Availability: Applications: **Military**
Aux Info:
Contact: **Linguistic Data Corporation** Institute: **LDC**
Telephone: **+1 215 898-0464** Fax: **+1 215 573-2175**
E-mail: **ldc@ldc.upenn.edu** Date Entered: 24 March 1997

Serial No: **23** Database Name: **1989 RAE Tornado Speech Database**
Description: **Recorded in rear seat of a Tornado under various flight conditions.**
Purpose: **Development and evaluation of speech recognisers for military fast jets.**
Material: **Digits, digit triples, and command phrases** Language: **UK English**
Quantity: **30** Hours No of Spkrs: **6** Gender: **MALE** Year: **1989**
Microphone: **RAF Oxygen mask** Signal: **Speech waveform, Lx,** Sampling Rate: **32 kHz**
Medium: **DAT** Annotation:
Availability: **NATO Restricted** Applications: **Fast-jet aircraft**
Aux Info: **Ground training data included.**
Contact: **A J South** Institute: **DERA/Farnboro'**
Telephone: **+44 1252 392496** Fax: **+44 1252 393091**
E-mail: **ajsouth@dra.hmg.gb** Date Entered: 24 March 1997

Serial No: **24** Database Name: **NOISEX-92**
Description: **Speech with noise ADDED at various SNRs**
Purpose: **Comparative experiments on recognition in additive noise.**
Material: **Digits and digit triples** Language: **UK English**
Quantity: **5** Hours No of Spkrs: **2** Gender: **BOTH** Year: **1992**
Microphone: **SM-10** Signal: **waveform** Sampling Rate: **16 kHz**
Medium: **CD-ROM** Annotation: **SAM format**
Availability: **Unlimited** Applications: **Recognition**
Aux Info: **2 Speakers from EUROM-0**
Contact: **J McQuillan** Institute: **DERA/SRU**
Telephone: **+44 1684 894361** Fax: **+44 1684 894540**
E-mail: **jmq@signal.dra.hmg.gb** Date Entered: 20 April 1994

Serial No: **25** Database Name: **Isolated digits FDC**
Description: **One of a series of databases for military aircraft applications**
Purpose: **Study of effects of G-load**
Material: **Isolated digits** Language: **French**
Quantity: **1** Hours No of Spkrs: **4** Gender: **BOTH** Year: **1991**
Microphone: **Oxygen mask** Signal: **waveform** Sampling Rate:
Medium: **DAT** Annotation: **?**
Availability: **Restricted** Applications: **Fast-jet aircraft**
Aux Info:
Contact: **C. Gulli** Institute: **Sextant**
Telephone: **+33 5 56 13 52 25** Fax: **+33 5 56 13 50 54**
E-mail: Date Entered: 21 April 1994

Serial No: **26** Database Name: **CVCV FDC Words**
Description: **One of a series of databases for military aircraft applications**
Purpose: **Study of effects of G force**
Material: **Phonetically balanced CVCV words** Language: **French**
Quantity: **1** Hours No of Spkrs: **4** Gender: **BOTH** Year: **1991**
Microphone: **Oxygen mask** Signal: **Waveform** Sampling Rate:
Medium: **DAT** Annotation: **PTR**
Availability: **Restricted** Applications: **Fast-jet aircraft**
Aux Info:
Contact: **C. Gulli** Institute: **Sextant**
Telephone: **+33 5 56 13 52 25** Fax: **+33 5 56 13 50 54**
E-mail: Date Entered: 21 April 1994

Serial No: **27** Database Name: **ALPHAJET**
Description: **One of a series of databases for military aircraft applications**
Purpose: **Assessment of recognition rate in military cockpit**
Material: **Cockpit commands (Rafale)** Language: **French**
Quantity: **4** Hours No of Spkrs: **6** Gender: **MALE** Year: **1994**
Microphone: **Oxygen mask** Signal: **Waveform** Sampling Rate:
Medium: **DAT** Annotation: **PTT**
Availability: **Restricted** Applications: **Fast-jet aircraft**
Aux Info:
Contact: **C. Gulli** Institute: **Sextant**
Telephone: **+33 5 56 13 52 25** Fax: **+33 5 56 13 50 54**
E-mail: Date Entered: 21 April 1994

Serial No: **28** Database Name: **MIR 3 B**
Description: **One of a series of databases for military aircraft applications**
Purpose: **Assessment of recognition rates in military cockpit**
Material: **Cockpit commands** Language: **French**
Quantity: **1** Hours No of Spkrs: **4** Gender: **MALE** Year: **1989**
Microphone: **Oxygen mask** Signal: **Waveform** Sampling Rate:
Medium: **VAX files** Annotation: **PTT**
Availability: **Restricted** Applications: **Fast-jet aircraft**
Aux Info: **Some G conditions**
Contact: **C. Gulli** Institute: **Sextant**
Telephone: **+33 5 56 13 52 25** Fax: **+33 5 56 13 50 54**
E-mail: Date Entered: 21 April 1994

Serial No: **29** Database Name: **Multi-Helicare**
Description: **One of a series of databases for military aircraft applications**
Purpose: **Assessment of recognition rates in military helicopter**
Material: **Avionic sentences** Language: **French**
Quantity: 1 Hours No of Spkrs: **3** Gender: **MALE** Year: **1994**
Microphone: Signal: **Waveform** Sampling Rate:
Medium: **DAT** Annotation: **PTT**
Availability: **Restricted** Applications: **Helicopter**
Aux Info: **PUMA**
Contact: **C. Gulli** Institute: **Sextant**
Telephone: **+33 5 56 13 52 25** Fax: **+33 5 56 13 50 54**
E-mail: Date Entered: 21 April 1994

Serial No: **30** Database Name: **SE1 FDC**
Description: **One of a series of databases for military aircraft applications**
Purpose: **Assessment of recogniton rate under adverse conditions**
Material: **Avionic sentences** Language: **French**
Quantity: 1 Hours No of Spkrs: **6** Gender: **BOTH** Year: **1991**
Microphone: **Oxygen mask** Signal: **Waveform** Sampling Rate:
Medium: **DAT** Annotation: **PTT**
Availability: **Restricted** Applications: **Fast-jet aircraft**
Aux Info:
Contact: **C. Gulli** Institute: **Sextant**
Telephone: **+33 5 56 13 52 25** Fax: **+33 5 56 13 50 54**
E-mail: Date Entered: 21 April 1994

Serial No: **31** Database Name: **SE2 FDC**
Description: **One of a series of databases for military aircraft applications**
Purpose: **Assessment of recognition rate under G**
Material: **Avionic sentences** Language: **French**
Quantity: 1 Hours No of Spkrs: **6** Gender: **BOTH** Year: **1992**
Microphone: **Oxygen mask** Signal: **Waveform** Sampling Rate:
Medium: **DAT** Annotation: **PTT**
Availability: **Restricted** Applications: **Fast-jet aircraft**
Aux Info:
Contact: **C. Gulli** Institute: **Sextant**
Telephone: **+33 5 56 13 52 25** Fax: **+33 5 56 13 50 54**
E-mail: Date Entered: 21 April 1994

Serial No: **32** Database Name: **DRA Farnborough Centrifuge Recordings**
Description: **Recordings of digit strings and command phrases with various types of protection**
Purpose: **Characterisation of effects of G on speech production and recogniser performance**
Material: **25, 5 digit strings, 25 phrases, 11 SCRIBE B sente** Language: **UK English**
Quantity: 12 Hours No of Spkrs: **6** Gender: **BOTH** Year: **1994**
Microphone: **Oxygen mask** Signal: **Waveform** Sampling Rate: **16 kHz**
Medium: **two CD-ROMs** Annotation: **SAM format**
Availability: **NATO Restricted** Applications: **Fast-jet aircraft**
Aux Info: **5 males, 1 female**
Contact: **A J South** Institute: **DERA/Farnboro'**
Telephone: **+44 1252 392496** Fax: **+44 1252 393091**
E-mail: **ajsouth@dra.hmg.gb** Date Entered: 24 March 1997

Serial No: **33** Database Name: **Cockpit control**
Description: **Command strings and isolated words for control of F-16**
Purpose: **Recogniser evaluation**
Material: **Cockpit control words (281 word vocabulary** Language: **English**
Quantity: **10** Hours No of Spkrs: **5** Gender: **MALE** Year: **1996**
Microphone: **Electret, fitted inside mask** Signal: **Waveform** Sampling Rate: **48 kHz**
Medium: **DAT** Annotation: **Word level**
Availability: Applications: **Military Fast jet**
Aux Info:
Contact: **Dr. H J M Steeneken** Institute: **TNO/IZF**
Telephone: **+31 3463 56269** Fax: **+31 3463 53977**
E-mail: **steeneken@tm.tno.nl** Date Entered: 30 October 1996

Serial No: **34** Database Name: **SUSC-0**
Description: **Speech Under Stress Conditions**
Purpose: **Analysis of stressed speech and testing of systems**
Material: **Fighter controller dialogues, spontaneous cockpit** Language: **English**
Quantity: 3 Hours No of Spkrs: 12 Gender: **Male** Year: **1995**
Microphone: **Various** Signal: **Waveform** Sampling Rate: **16 kHz**
Medium: **one CD-ROM** Annotation:
Availability: Applications: **Research**
Aux Info:
Contact: **Dr. H J M Steeneken** Institute: **TNO/IZF**
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E-mail: **steeneken@tm.tno.nl** Date Entered: 30 October 1996

Serial No: **35** Database Name: **Tornado SI training data**
Description: **240 words from cockpit tasks, 29 speakers, oxygen mask and noise-in-ears**
Purpose: **Training data for speaker-independent tests on recognisers**
Material: **Isolated words, some digit strings** Language: **UK English**
Quantity: **14** Hours No of Spkrs: **29** Gender: **MALE** Year: **1996**
Microphone: **Oxygen mask** Signal: **Waveform** Sampling Rate: **48/16 kHz**
Medium: **DAT or CD-ROM** Annotation: **SAM format from PTR**
Availability: **Nato restricted** Applications: **Fast-jet aircraft**
Aux Info:
Contact: **A J South** Institute: **DERA/Farnboro'**
Telephone: **+44 1252 392496** Fax: **+44 1252 393091**
E-mail: **ajsouth@dra.hmg.gb** Date Entered: 30 October 1996

Serial No: **36** Database Name: **SUSAS**
Description: **Stressed speech from fairground rides and helicopters, multi-style speech**
Purpose: **Research into speech under stress**
Material: **35 aircraft communication words** Language: **US English**
Quantity: **2** Hours No of Spkrs: **20** Gender: **BOTH** Year: **1995**
Microphone: Signal: Sampling Rate:
Medium: **CD-ROM** Annotation:
Availability: Applications: **Research**
Aux Info:
Contact: **JHL Hansen** Institute: **Duke Univ.**
Telephone: **+1 919 660 5256** Fax: **+1 919 660 5293**
E-mail: **jhlh@ee.duke.edu** Date Entered: 30 October 1996

Serial No: **37** Database Name: **DCIEM Sleep Deprivation Study Map Task Corpus**
Description: **HCRC Map Task carried out during 64 hour without sleep, with drugs or placebo**
Purpose: **Part of a major study on effects of continuous work in prolonged sleep deprivation**
Material: **Spontaneous dialogues on HCRC Map task** Language: **English**
Quantity: **18** Hours No of Spkrs: **36** Gender: **BOTH** Year: **1994**
Microphone: **Shure SM10A** Signal: **Waveform** Sampling Rate:
Medium: **CD-ROM** Annotation: **Orthographic, turn onset, sgml**
Availability: **Unlimited** Applications: **Studies of dialogue, etc.**
Aux Info:
Contact: **Linguistic Data Corporation** Institute: **LDC**
Telephone: **+1 215 898-0464** Fax: **+1 215 573-2175**
E-mail: **ldc@ldc.upenn.edu** Date Entered: 01 April 1997

Serial No: **38** Database Name: **Tornado TV-TABS**
Description: **Recordings made in the back seat of Tornado GR1**
Purpose: **Assessment of ASR in fast-jet**
Material: **Isolated & connected digits, Command phrases** Language: **English**
Quantity: **10** Hours No of Spkrs: **6** Gender: **MALE** Year: **1993**
Microphone: **P/Q Oxygen mask** Signal: **Waveform** Sampling Rate: **16 kHz**
Medium: **CD-ROM or DAT** Annotation: **SAM format, via PTR**
Availability: Applications: **Fast-jet**
Aux Info: **Training material recorded on ground, noise in ears,**
Contact: **A J South** Institute: **DERA/Farnboro'**
Telephone: **+44 1252 392496** Fax: **+44 1252 393091**
E-mail: **ajsouth@dra.hmg.gb** Date Entered: 07 April 1997

Serial No: **39** Database Name: **DERA Car number plate database**
Description: **Dictation of UK car number plates**
Purpose: **Evaluation of ASR under stressed speech**
Material: **UK Car numbers with digits and ICAO alphabet** Language: **UK English**
Quantity: **5** Hours No of Spkrs: **16** Gender: **BOTH** Year: **1995**
Microphone: **SM-10** Signal: **Waveform** Sampling Rate:
Medium: **CD-ROM** Annotation:
Availability: **Unlimited** Applications: **ASR Assessment**
Aux Info: **Two speed conditions**
Contact: **J McQuillan** Institute: **DERA/SRU**
Telephone: **+44 1684 894361** Fax: **+44 1684 894540**
E-mail: **jmq@signal.dra.hmg.gb** Date Entered: 05 June 1997

Serial No: **40** Database Name: **Lynx Simulation database**
Description: **Helicopter cockpit control phrases recorded in realistic noise and vibration**
Purpose: **Assessment of recogniser performance in helicopter environment**
Material: **DVI command phrases, isolated word training data** Language: **English (UK)**
Quantity: **18** Hours No of Spkrs: **7** Gender: **MALE** Year: **1997**
Microphone: **Socapex 1091/G or Racal D13750** Signal: **Waveform** Sampling Rate: **16 kHz**
Medium: **CD-ROM (or DAT)** Annotation: **SAM format**
Availability: **Yes (terms under discussion)** Applications: **Recogniser assessment**
Aux Info: **Speakers were flying simulated attack helicopter missions to provide workload stimulation while reading lists.**
Contact: **A J South** Institute: **DERA/Farnboro'**
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Annex C. Other Sources of Information

For details of other speech and language databases (not specifically military), see:

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Web: http://www.ldc.upenn.edu

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Web: http://www.icp.grenet.fr/ELRA/home.html

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Recording
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14. Abstract

A NATO research group carried out collaborative studies on military applications of speech processing. A major requirement in this area of work is for large quantities of speech recordings made in military environments, which are often expensive and difficult to obtain. Research and development in this area will benefit from sharing such data as widely as possible among the NATO research community.

The cost of collecting speech recordings under realistic military conditions is high. Considerable cost savings may be made if such data are shared as widely as possible amongst the NATO community. The NATO research group on speech processing will continue to maintain and update the database of speech recordings relevant to military applications of speech technology. Further ways of disseminating this information will be sought, including electronic means such as the Internet.

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